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SILVICAL LEAFLET 11.

GIANT ARBORVITÆ.

Thuja plicata Don.

Although of less commercial importance than many of the species with which it grows, giant arborvitæ is nevertheless extensively cut with other trees, and its wood is highly valued for shingles, cooperage, and other uses for which it is especially adapted by its lightness, durability, and straight grain. It will undoubtedly play a part in the future management of the dense, mixed forests of which it is a prominent member. To achieve the best results with it the forest in which it grows should be managed as selection forest. The silvicultural treatment of giant arborvitæ will, however, depend to a large extent upon that required by more valuable species present in the stand.

RANGE AND OCCURRENCE.

Giant arborvitæ occurs in the forests of the Pacific coast from Cape Mendocino, in northern California, northward through Oregon, Washington, British Columbia, and southern Alaska, to Sitka. It extends from the coast eastward through the Coast ranges and the Cascade Mountains to the western slope of the Rocky Mountains in northern Idaho, Montana, and British Columbia.

Its altitudinal range extends, in general, from sea level to an elevation of 7,000 feet. It grows at sea level along the coast of the mainland and on the islands of British Columbia and southern Alaska, and ascends to elevations of from 5,000 to 6,000 feet in its range toward the Rocky Mountains, where it grows occasionally at an elevation of 7,000 feet.

CLIMATE.

The climate within the range of giant arbovitæ is in general favorable for forest growth. It is uniform and mild, although the annual precipitation varies from an average of 20 to an extreme of over 100 inches from California to Alaska and from the coast to the Rocky Mountains. The temperature drops to -30° F. within its range. The changes of temperature are, however, gradual, and where precipitation is low giant arbovitæ confines itself to situations where soil moisture is abundant.

HABIT.

As its name implies, giant arbovitæ sometimes reaches gigantic proportions. Its development, however, depends upon soil, moisture, and climate, and its size varies with these. On the coast the tree often attains a diameter of 15 feet and a height of 200, while at high altitudes it may be a mere shrub. In general, on the coast and in favorable situations in its eastward range it has a diameter of from 4 to 6 feet and a height of from 150 to 200 feet, but toward the limits of its range, and especially on the west slope of the Rocky Mountains, it has a diameter of only from 2 to 3 feet and a height of about 100 feet.

Giant arbovitæ has a long, irregularly open, conical crown, which branches or breaks frequently into two or more leaders. It has flat, deciduous sprays, yet the small, scale-like foliage on the larger branches themselves persists several years. Its trunk has a rapid taper and is heavily buttressed at the base. It is usually very branchy, and does not clean itself well. The crown often covers two-thirds of the stem.

ASSOCIATED SPECIES.

Giant arbovitæ does not, as a rule, form pure stands over extensive areas, but in favorable situations grows in dense groups, groves, and patches to the exclusion of other species. It associates in the forests of Oregon and Washington, and northward along the coast, chiefly with western hemlock, Sitka spruce, lowland fir, Douglas fir, and California yew. In the redwood forests of California it grows with the redwood and hemlock. In swampy situations it is mixed in with the swamp hardwoods, such as maple, alder, and poplar. At higher elevations in the Cascade Mountains and on the western slope of the Rocky Mountains it grows with western white pine, western larch, lodgepole pine, and Engelmann spruce, and to some extent with black hemlock.

SOIL AND MOISTURE.

Giant arborvitæ is confined chiefly to moist situations, such as the bottomland along the coast, river bottoms, canyons, gulches, ravines, swamps, and benches, and cool, moist slopes.

The tree does best on deep, porous soils. With an abundance of soil moisture it thrives on poor, thin soils and in exposed situations. Occasionally it grows on apparently dry soils. The greater the amount of soil and atmospheric moisture the less is the tree's demand upon soil, and vice versa.

Giant arborvitæ is most abundant on the moist soils along the coast. It disappears in dry situations and in the dry basins between the Rocky Mountains and the Pacific coast, but reappears again abundantly in the humid forests of northern Idaho, Montana, and British Columbia—on the western slope of the Rocky Mountains.

TOLERANCE.

The tree is one of the most tolerant of the Pacific coast trees. It can endure considerable shade during all stages of life, but especially during its seedling stages. Light becomes more necessary for the best development with advancing age. Its endurance of shade is greater toward its southern limit in California, and it is greater along the coast than at high elevations. Shade becomes essential in comparatively warm and dry situations to reduce transpiration and evaporation. The tree commonly forms an understory, sometimes with western hemlock, under more light-demanding species. It often forms also the dominant stand with western hemlock.

REPRODUCTION.

Giant arborvitæ is a prolific seeder. It is sometimes covered with cones at elevations where it is a mere shrub. It produces seeds every year, but particularly good seed years occur at somewhat irregular intervals.

The seeds mature early in the summer, and under favorable conditions they fall and germinate, and the seedlings reach a height of from 2 to 4 inches before cold weather sets in. The seeds germinate readily, and the seedlings thrive on wet duff, litter, moss, decaying wood, muck, and mineral soils.

[Leaf. 11]

